

What is claimed is:

1. An apparatus for providing link layer security in a Physical Layer Transceiver (PHY) comprising:

analog circuitry configured to transmit to, and receive data from, a data transmission medium;

digital circuitry coupled to said analog circuitry, said digital circuitry configured to transmit to, and receive from, a Media Access Controller (MAC);  
and

a crypto engine coupled to said digital circuitry.

2. The apparatus of claim 1, wherein said crypto engine and said PHY are disposed on the same physical chip.

3. The apparatus of claim 2, wherein said crypto engine uses pre-existing hardware on said chip, said hardware pre-existing for the purpose of enabling the function of said PHY.

4. The apparatus of claim 2, wherein said apparatus is a component of a multi-PHY device.

5. The apparatus of claim 2, wherein said PHY communicates using a serial PHY media interface.

6. The apparatus of claim 3, wherein said pre-existing hardware is chosen from the group consisting of: said PHY's pin functionality, memory map, state machine, signals, signal buses and logic gates.

7. The apparatus of claim 2, wherein said crypto engine is further configured to perform a secondary function.

8. The apparatus of claim 7, wherein said secondary function comprises marking undesired data for dropping.

9. The apparatus of claim 2, wherein said MAC comprises an ASIC further configured as a switching fabric.

10. The apparatus of claim 9, wherein said apparatus is disposed within a router.

11. The apparatus of claim 10, wherein said crypto engine is further configured to manage data packet collisions.

12. A method of providing link layer security between a transmitting PHY and a receiving PHY, said method comprising:

receiving, by the transmitting PHY, data from a first MAC;

encrypting, by said transmitting PHY, said data, producing encrypted data;

transmitting, by said transmitting PHY, said encrypted data to said receiving PHY;

receiving, by said receiving PHY, said encrypted data;

decrypting, by said receiving PHY, said encrypted data; and

providing the de-crypted data to a second MAC.

13. The method of claim 12, further comprising the acts of:

storing, by said transmitting PHY, said encrypted data;

determining whether a packet collision has occurred; and

if a collision has occurred, then re-transmitting said stored encrypted data.

14. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method, the method comprising:

receiving, by the transmitting PHY, data from a first MAC;

encrypting, by said transmitting PHY, said data, producing encrypted data;

transmitting, by said transmitting PHY, said encrypted data to said receiving PHY;

receiving, by said receiving PHY, said encrypted data;

decrypting, by said receiving PHY, said encrypted data; and

providing the de-crypted data to a second MAC.

15. The device of claim 14, wherein said method further comprises the acts of:
- storing, by said transmitting PHY, said encrypted data;
  - determining whether a packet collision has occurred; and
  - if a collision has occurred, then re-transmitting said stored encrypted data.
16. An apparatus for providing link layer security in a Physical Layer Transceiver (PHY) comprising:
- means for receiving data from a first MAC;
  - means for encrypting said data, producing encrypted data;
  - means for transmitting said encrypted data to said receiving PHY;
  - means for receiving said encrypted data;
  - means for decrypting said encrypted data; and
  - means for providing the de-crypted data to a second MAC.
17. The apparatus of claim 16, further comprising:
- means for storing said encrypted data;
  - means for determining whether a packet collision has occurred; and
  - means for re-transmitting said stored encrypted data.
18. The apparatus of claim 17, wherein said crypto engine means is further configured to perform a secondary function.

19. The apparatus of claim 18, wherein said secondary function comprises data compression.

20. The apparatus of claim 16, wherein said MAC further comprises switching fabric means.